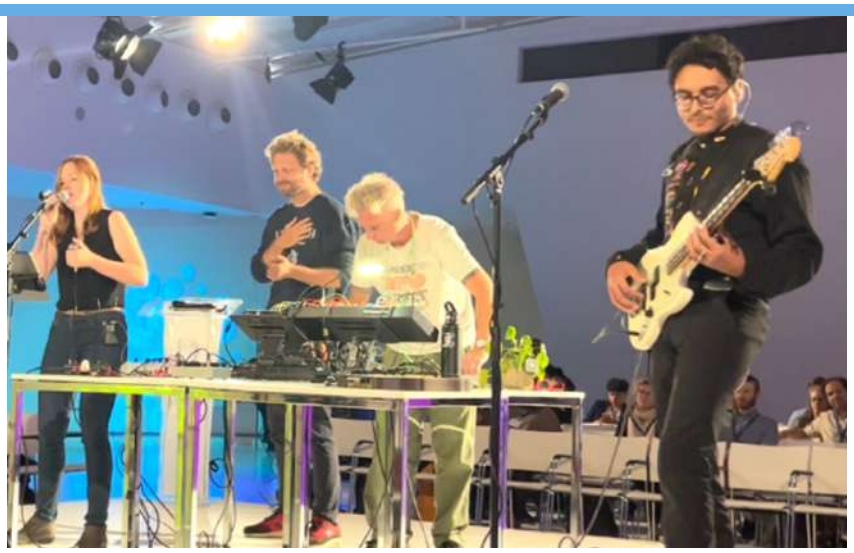
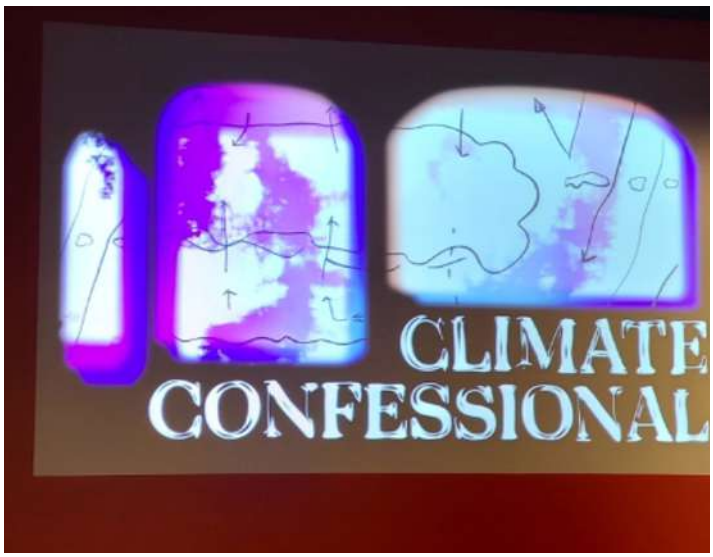
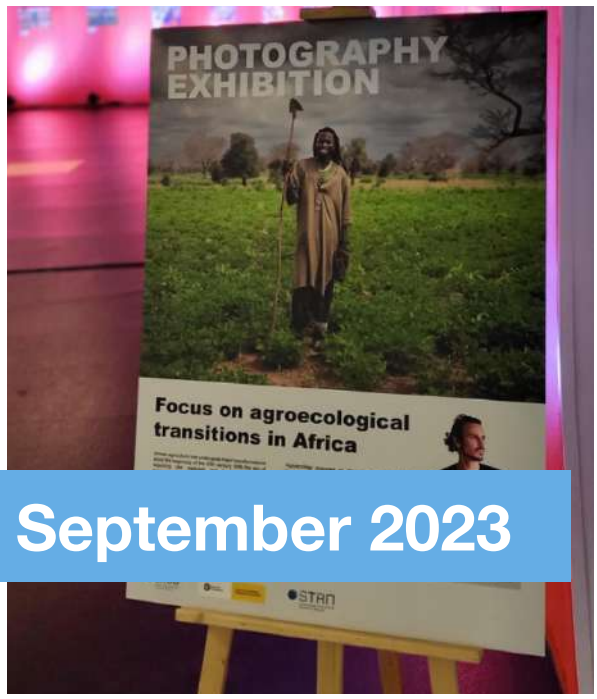
STRN Newsletter







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Sustainability Transitions Research Network.

Newsletter 49 – September 2023

Content

About

The STRN newsletter is published four times a year in March, June, September & December

Cover:
Pictures from IST 2023

Editorial

by Adriaan van der Loos, Simona Negro and Wouter Boon

On behalf of the entire IST 2023 organizing committee

Reflections on IST 2023 – A word from the organizing committee

We would like to take a moment to reflect back on IST 2023. Afterall, reflexivity was a core theme of the conference. IST 2023 took place just a few weeks ago in Utrecht, the Netherlands, hosted by the Copernicus Institute of Sustainable Development. It was the first fully in-person IST in four years, held at a time of grand societal challenges, such as food security, energy reliability, climate change, biodiversity loss and economic security for vulnerable populations. We had well over 500 participants, a record for IST and it was clear that everyone was thrilled to be back together, networking, drinking coffees, sharing cutting edge research and guiding many workshops.

Indeed, the sessions ranged from classic full paper presentations to speed talks to special sessions to dialogue sessions. The dialogue sessions were particularly notable with groups of researchers fostering and guiding engaging and interactive moments of reflection and deliberation. Many state-of-the-art topics were fiercely discussed and deliberated upon, including on Just Transitions (a very popular theme throughout the conference), local communities, unsustainabilities, critical reflections on innovation in transitions, agri-food transitions and methodological diversity, to name a few.

In addition to that, we were extremely happy to welcome policy makers from a variety of scales, from an emerging innovative sustainable neighborhood (Merwede Kanaalzone, Utrecht) to a city (Amersfoort) to a Province (Utrecht) to the European Union, to join us in a science-policy debate with the goal to reflect on how, in what ways and to what extent should scientists and policy makers work together to foster transitions.

The conference was also filled with artistic moments, designed to work together to co-generate knowledge on transitions and reflect on how art-science interfaces can become more closely intertwined and strengthen each other. We had musical performances at the opening and closing sessions, a reflection space called Time Troublers, the Climate Confessionals and a photography exhibit. You were never far from being forced to stretch the bounds of thinking.

Two additional events are worth highlighting. The first is the flagship Reflexivity Workshop, which encouraged us to critically reflect on who we are as researchers. Do we want to create new solutions or reveal and critique problems? Are we knowledge producers who generate insights that others can use to make change, or are we action-oriented researchers who play an active role in processes that make change happen? By removing the chairs from the central auditorium, we forced everyone out of their comfort zone to interact, engage and reflect. There was no hiding behind your laptop to check your email or sitting in the back of the room; rather, a safe and inclusive space nurtured listening and reflection.

Finally, our keynote lecture by Professor Mark Swilling, director of the Center for Sustainability Transitions in Stellenbosch, South Africa was truly an inspiring moment that brought in a much broader global context to questions of transitions, as well as how we as transition scholars could and should position ourselves.

While the content program was extensive, invigorating, through-provoking and, at times, overwhelming, we also took the time to reconnect with each other after so many years of online meetings and conferences. For the roughly 150 early career researchers, an entire day was dedicated to connecting and sharing around the theme of 'positionality'. Networking drinks sponsored by the Province of Utrecht at the end of the first full conference day was the first big moment to take a breath. Our Asian-fusion dynamic dinner at LE:EN continued the trend of synergistic energy by breaking down the norm of traditional tables at a conference dinner; and the energetic party at De Helling, DJ'd by three transitions' scholars, will be remembered for many ISTs to come.

As we tie up the loose ends from this year's IST, IST 2024 is well into the planning stages, and we hope to see many of you all again in Oslo!

EIST Journal

We are happy to introduce the most recent issue of EIST, published in Volume 48. The full list of papers is featured in the publication section of this newsletter.

We are also happy to welcome two new editors to our team:
Birthe Soppe as a senior associate editor,
and
Xiao-Shan Yap as a junior associate editor.

Both were selected from those who responded to our open call for two female associate editor positions in the June newsletter.

Bernhard Truffer
Editor-in-Chief EIST

STRN News

15th IST Conference, Oslo
June 17th – 19th, 2024

The next IST conference will be hosted by the TIK Centre for Technology, Innovation and Culture and it will be co-organized with other research institutes from Norway. The conference chair will be Prof. Taran Thune.

STRN professionalization

On August 29, 2023, the STRN board met for the first time with representatives of the institutional members of STRN to discuss our plans for the next years (e.g., to provide better support in terms of resources for research and teaching or to launch an additional PhD/ECR school, next to the methods school) and to get their feedback.

We also want to hear about the ideas and interests of the wider STRN community. We will be sending out a survey shortly, which will be announced through the mailing list.

Finally, STRN is very happy to announce that Drift and Manchester Institute of Innovation Research have decided to support our network as institutional members.

Institutional members

Copernicus Institute of Sustainable Development
Utrecht University, The Netherlands

Department of Technology, Innovation and Society
Eindhoven University of Technology, The Netherlands

Fraunhofer Institute for Systems and Innovation Research ISI
Karlsruhe, Germany

Group for Sustainability and Technology
ETH Zurich, Switzerland

TIK Centre for Technology, Innovation and Culture
Oslo University, Norway

Cirus Research Group
Eawag, Switzerland

Monash Sustainable Development Institute
Monash University, Australia

AIT Austrian Institute of Technology
Vienna, Austria

Finnish Environment Institute – Syke
Helsinki, Finland

CIRCLE
Lund University, Sweden

CIIST, Initiative for Innovation and Sustainability Transitions, Chalmers University of Technology, Sweden

DRIFT
Erasmus University of Amsterdam, The Netherlands

Manchester Institute of Innovation Research
University of Manchester, United Kingdom

There are more institutions in the process of joining and we will announce them in due course.

If your institute may be interested in joining as an institutional member, please contact us for more information.

IST Best Paper Award

We are happy to announce the winner and two shortlisted papers for the IST Best Paper Award.

Improving Discursive Approaches to Sustainability Transition Studies: Elaborating Discourse Network Analysis
By Kimberley Vandenhole, Kristijan Garic, Philip Leifeld

The paper applies discourse network analysis as a method for studying sustainability transition processes. It is well written, includes a state-of-the-art literature review, and provokes discussion on the application of mixed methods in transition studies. Its novel contribution is taking a dynamic perspective into discourse analysis.

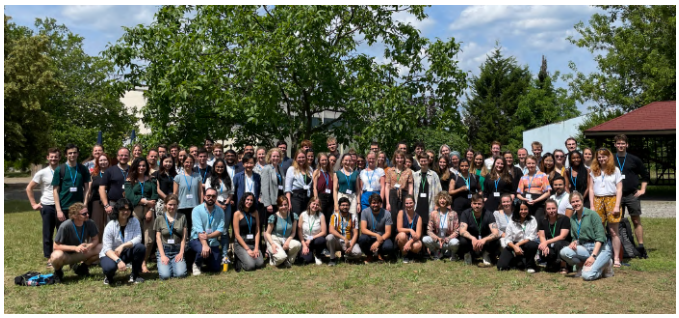
Runners up:
The politics of directionality in transformative innovation policy through the lens of policy process frameworks
By Sabine E. de Graaff, Iris Wanzenböck, Koen Frenken

The paper addresses directionality as a political process in the context of a new generation of innovation policy. It has a well-written conceptual analysis and a novel contribution in attempting to conceptualise directionality more specifically.

Technology innovation systems and financial development: Measuring the financial maturity of technologies
By Anurag Gumber, Florian Egli, Bjarne Steffen

The paper connects technology development to the financial regime, which is a novel angle, and contributes to the literature on finance in transitions. The conceptual contribution is the financial maturity framework.

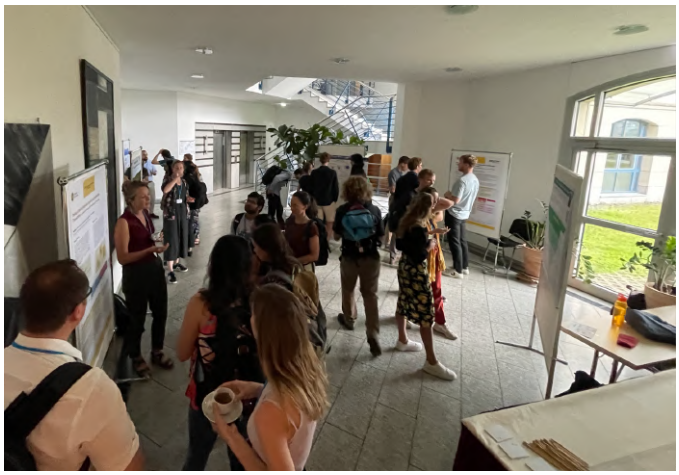
Past STRN Events



NEST Conference

The 8th Network of Early Career Researchers (NEST) conference took place from June 30 – July 1 and was hosted by the Leibniz-Institute of Ecological Urban and Regional Development (IOER) and the Dresden Leibniz Graduate School (DLGS) in Dresden, Germany. The event brought together about 125 PhDs and PostDocs from all over the world who are passionate about exploring urgent issues and novel approaches to address the pressing global challenges of sustainability, all in the spirit of the conference theme “Re-imagining transitions: beyond established methods and concepts”.

The two-day conference was organized in a hybrid manner and offered a diverse program filled with classical research presentation sessions, a science walk during which posters and research ideas were discussed over coffee, engaging workshops organized by the participants themselves that invited everyone to reflect in a creative manner and foster collaboration, as well as two inspiring, thought-provoking keynotes by Martin Savransky and Zora Kovacic.



On the first day of the conference, Martin Savransky talked about speculative transitions and invited the participants to reflect on how to sustain sociality at the end of the world. In his talk, he highlighted the need for radical social-ecological change and justice to re-imagine transitions and to avoid reproducing neocolonial geographies and dependencies. On the second day, the participants started by reflecting on the role of complexity in governing transitions together with Zora Kovacic who, in her keynote, talked about the importance of moving away from governance of transitions towards governance for transitions.

The interactive atmosphere at the conference fueled an exchange of ideas and a platform for collaboration. Due to the hybrid format, the conference was inclusive and gave many young researchers from all over the world the opportunity to present their ideas and projects. The various sessions also offered an intensive exchange between online and on-site participants.

The participants’ enthusiasm was palpable as they engaged in lively discussions on topics such as policy, collaboration, civil society, actors and organisations, geography, agriculture and food, urban settings, circular economy, narratives and ethical aspects and many more – all in the light of sustainability transitions. Time for informal exchange was of course not to be missed. In addition to coffee and lunch breaks with vegan food, on-site participants could revive old friendships and make new ones during an informal get-together in the evening in a beer garden at the Elbe.

NEST conferences are not just like any other conference but reflect the collective power and collaborative spirit of the entire NEST community, manifested not only in the bottom-up organization by volunteering members of the community but also in the atmosphere during the conference. Thank you to everyone who contributed to the success of the 8th NEST conference, and we look forward to seeing you all next year!

8th NEST conference organizing team:
Lea Stöber, Jonathan Friedrich, Thiago Ferreira Quilice, Nkweauseh Reginald Longfor, Friederike Elsner, Karlotta Koch, Mabel Killinger, Subhashree Nath, Anna Baatz, Daniel Peter, Katharina Bullinger, Marina Novikova, Raghid Sheyaheb

Reflections on the NEST ECR Day at IST 2023, August 29

During the ECR day, hosted by NEST and the Copernicus Institute of Sustainable Development, more than 150 early career transitions researchers gathered in Utrecht. We kicked off with a morning programme on the role of positionality in your research. Our chairs for the day, Julia Wittmayer, Katharina Schiller, Mapula Tshangela and Flor Avelino each shared their insights on how they approach positionality in their research. In subgroups, we discussed reflections on our own positionality and the concept itself. Enjoying the good weather, many groups sat outside and discussed topics related to positionality, such as working in multidisciplinary research projects and the challenges and benefits of working with stakeholders. We ended the day at an old train depot in Utrecht, where we exchanged over dinner & drinks and most importantly: played Ping-Pong together! If you are interested in staying up to date on activities for ECR scholars in transitions, or if you want to get involved in organizing this yourself, you can reach out to Sophie-Marie and Tom from NEST at transitions.nest@gmail.com or visit our website.

The NEST ECR Day Organizers,
Abe, Matthijs, Mayte, Nikhil, Sabine

Spotlights from the IST conference

Reflexive Monitoring
by Barbara van Mierlo

We had a lively dialogue with practitioners of Reflexive Monitoring (researchers as well as others) and people interested, at the International Sustainability Transitions Conference. It was the first activity of the recently established Community of Practice on Reflexive Monitoring in Action.

What does it mean to operate at the boundaries of a system change initiative and its institutional setting and how do practitioners navigate both in- and external resistance? We learned about the need to involve middle management, how to start subtly if conditions for making room for change are not yet in place, how to relate to commissioners and much more.

A big thank you to my co-chair TJ Schuitmaker-Warnaar, the audience and the panel members Corine Quarles van Ufford, Carolien de Vries, Eva Kunseler, PhD, PJ Beers, Barbara Regeer, Anne Loeber, Kris Kok and Lieselot Vandenbussche.

Reflections on musicality at IST
by Josie Chambers

Electronic artist and sustainability researcher Drusnoise (Steve Williams), Urban Futures Studio researcher (and vocalist) Josie Chambers, and bass player and nature conservationist Noor Noor collaborated to create an emotive and thought-provoking opening to the conference. It included holding up a mirror to the language we use more or less often in sustainability transitions, and even fed in the live heartbeat of audience member Joost Vervoort. Stay tuned for a release of the full performance! Afterwards, a range of researchers met up in a session to discuss possibilities at the intersection of music, science, and sustainability, and jammed together on the spot.

Reflections on religious repertoires
by Tim Stacey

Tim Stacey of the Urban Futures Studio, Copernicus Institute of Sustainable Development, offered a provocative opening talk in which he invited delegates to be aware of the "religious repertoires" shaping their scientific practices and approaches to sustainability. To aid in this process, the Urban Futures Studio collaborated with a range of artists to provide conference interventions. These included Ekaterina Volkova and Julien Thomas's (aka Perception Design Studio) Climate Confessional, which invited people to reflect on their personal experiences as researchers, and Katía Truijen and Michiel van Iersel's (aka Loom) Time Troublers, which invited people to reflect on the role of time in relation to their life, work, and the climate. Collectively, these interventions helped participants to slow down, take stock, and, as the conference asked, reflect on their own responsibilities for each other and the wider world.

Publications

PhD Theses

Wainaina, G. K.. (2023)
Challenges of Improving Livelihoods by Slum Upgrading - A Sociotechnical Transitions Perspective Utrecht University
Link

The role of infrastructure in transforming livelihoods is crucial, especially in the global south where over a billion live in conditions without basic service infrastructure for water, sanitation, mobility, solid waste and lighting popularly known as slums. Most such initiatives deliver infrastructures that often fail to improve livelihoods and that even deteriorate a few years later. I investigated how programs aimed at providing such infrastructures can improve slum residents' livelihoods. To facilitate the investigation, I collected data from 16 slums in Kenya, which were part of the Kenya Informal Settlement Improvement Program that installed new basic service infrastructure in 80 slums. Findings indicated that new infrastructure disrupts or improves the following four dimensions to secure basic services and livelihoods: when residents conduct activities, how they use space, organize around provision and access, and pay. Residents take up such infrastructures critically or complementarily based on whether or not trust is broken during participation, transforming them to fit their needs and maintaining them in cases where the infrastructure has a net value to their livelihoods. In addition, only actors oriented to market thinking e.g. contractors, professionalism e.g., engineers and the community need be collaborative during participation to deliver infrastructure that benefits livelihoods. Lastly, failure to integrate insights about challenges in different slums by different actors to facilitate program learning leads to missed opportunities for improving livelihoods at city and national scales. For infrastructures to improve livelihoods, implementers need to ensure participation retains trust and anticipates post implementation infrastructure appropriation to improve livelihoods, understand and improve capabilities of different actors to involve residents, and plan for and finance program learning. Doing this will ensure sustained infrastructures that improve residents' livelihoods in the long term

Books

Araújo, Kathleen (ed.) (2023)
Routledge Handbook of Energy Transitions
Routledge
Link

This handbook draws upon a unique and multidisciplinary network of experts from around the world to explore the expanding field of energy transitions. The book recognizes that considerable changes are underway or are being developed for the modes in which energy is sourced, delivered, and utilized. Employing a sociotechnical approach that accounts for economics and engineering, as well as more cross-cutting factors, including innovation, policy and planning, and management, the volume considers contemporary ideas and practices that characterize the field. The book explores pressing issues, including choices about infrastructure, the role of food systems and materials, sustainability, and energy democracy. Disruption is a core theme throughout, with the authors examining topics such as digitalization, extreme weather, and COVID-19, along with regional similarities and differences. Overall, this book advances the field of energy transitions by connecting ideas, taking stock of empirical insights, and challenging how we think about the theory and practice of energy systems change.

Debizet, G., Pappalardo, M., Wurtz, F. (2022)
Local Energy Communities. Emergence, Places, Organizations, Decision Tools
Routledge
Link

This book draws on social science analysis to understand the ongoing dynamics within and surrounding local energy communities in reliably electrified countries.It describes how energy communities have emerged and how local renewable energy trading schemes have been set up in Belgium, Canada, France, Germany, the Netherlands, Spain, Switzerland and the United Kingdom. Analysing the main types of energy communities such as collective self-consumption, citizen cooperatives and peer-to-peer digital platforms, the book offers a comprehensive overview for all those contributing to the circular economy and the decentralization of energy production in inhabited areas. By revealing the contradictions between different stakes and between different spatial scales, as well as the antagonism between a market approach and a cooperative approach, it raises the essential questions of a non-centralized energy transition and provides keys for rethinking energy systems to the point of proposing new decision support tools.

Moore, T. & Doyon, A. (2023)
A transition to sustainable housing: Progress and prospects for a low carbon housing future
Palgrave MacMillan, Springer Nature

Link

This book explores the environmental, social, and financial challenges of housing provision, and the urgent need for a sustainable housing transition. We explore how market failures have impacted the scaling up of sustainable housing and the various policy attempts to address this. The book goes beyond an environmental focus and explores a range of housing related challenges including social justice and equity issues. We present sustainability transitions theory as a framework to help facilitate a sustainable housing transition and explore this through contemporary case studies: high performing housing, small housing, shared housing, neighbourhood-scale housing, circular housing, and innovative financing for housing. We discuss potential pathways and challenges that still need to be addressed. This book challenges policy makers, planners, housing construction industry stakeholders, and researchers to rethink what housing is, how we design and construct it, and how we can better integrate impacts on households to wider policy development.

Skjærseth, J.B., Hansen, T., Donner-Amnell, J., Hanson, J., Inderberg, T.H.J., Nielsen, H.Ø., Nygaard. B., Steen, M. (2023)
Wind Power Policies and Diffusion in the Nordic Countries. Comparative Patterns.
Palgrave Macmillan
Link

Extensive diffusion of renewable energy technologies is central in all scenarios that allow us to mitigate climate change. Wind energy is a key form of renewable energy production that needs to scale to replace fossil fuels. The Russian invasion of Ukraine has accentuated the need for energy independence in Europe through renewable energy. This underlines the importance of understanding the conditions that enable or impede widespread diffusion of wind energy including trade-offs with land use such as nature. In this book, we focus specifically on policy mixes and wind power diffusion in the four main Nordic countries – Denmark, Finland, Norway and Sweden. Although these four Nordic welfare states have much in common including state/society relations electrification needs, they have experienced quite dissimilar development patterns for wind power policies and actual development. Understanding these differences across the Nordic countries is the central puzzle that this book investigates from a social science perspective.
Empirically, studies of wind power policies in each of the countries abound, but there are no comparative studies of wind power policies in the Nordic countries. Analytically, we contribute to the transition policy mix literature which remains largely insensitive to political feasibility. In doing so, we apply a multilevel governance approach and introduce four complementary explanatory perspectives for how well wind power policies have been accepted by the policymakers whose support is needed for policy change: 1) energy-economic situation depicting the 'need' for wind power policies; 2) the role of the EU in downloading and uploading policies; 3) the role of domestic politics at national and local levels, and 4) change in wind power technology costs in the four countries.

Papers

EIST Volume 48

Dr Eleni Papadonikolaki, Dr Bethan Morgan, Dr George Papachristos
Megaprojects as niches of sociotechnical transitions: The case of digitalization in UK construction

Jessica Heiges
Eliminating single use disposable foodware: An emerging and cascading norm

Seulgi Son
Transitions in South Korean public food procurement policy: Landscape context, institutionalization, and local agents

Katarina Eckerberg, Therese Bjärstig, Matilda Miljand
Steering 'green' innovation policy toward sustainability? Lessons from implementing EIP-AGRI in Sweden

Katrin Pakizer, Eva Lieberherr, Megan Farrelly, Peter M. Bach, David Saurí, Hug March, Miriam Hacker, Christian Binz
Policy sequencing for early-stage transition dynamics – A process model and comparative case study in the water sector

Kees Stam, Edith van Ewijk, Paul W. Chan
How does learning drive sustainability transitions? Perspectives, problems and prospects from a systematic literature review

Saurabh Arora, Andy Stirling
Colonial modernity and sustainability transitions: A conceptualisation in six dimensions

Linda van de Burgwal, Tom van der Valk, Hannes Kempter, Manuel Gadau, David Stubbs, Wouter Boon

An elephant in the glasshouse? Trade-offs between acceleration and transformation in COVID-19 vaccine innovation policies

Brit M. Bulah, Maria Tziva, Christina Bidmon, Marko P. Hekkert
Incumbent entry modes and entry timing in sustainable niches: The plant-based protein transition in the United States, Netherlands, and United Kingdom

Remi Elzinga, Matthijs J. Janssen, Joeri Wesseling, Simona O. Negro, Marko P. Hekkert
Assessing mission-specific innovation systems: Towards an analytical framework

Paula Kivimaa, Marja Helena Sivonen
How will renewables expansion and hydrocarbon decline impact security? Analysis from a socio-technical transitions perspective

George Kiambuthi Wainaina, Bernhard Truffer, James T. Murphy
Structural tensions limiting success of infrastructure upgrading: A multi-regime perspective

Manon Eikelenboom, Alfons van Marrewijk
Creating points of opportunity in sustainability transitions: Reflective interventions in inter-organizational collaboration

Bård Torvetjønn Haugland
The future is present: Prefiguration in policy and technology experimentation

Martijn Wiarda, Tom B.J. Coenen, Neelke Doorn
Operationalizing contested problem-solution spaces: The case of Dutch circular construction

Lena Schøning, Vera Helene Hausner, Mathilde Morel
Law and sustainable transitions: An analysis of aquaculture regulation

Jonathan Friedrich, Heiko Faust, Jana Zscheischler
Incumbents' in/ability to drive endogenous sustainability transitions in livestock farming: Lessons from Rotenburg (Germany)

Kevin Joseph Dillman, Jukka Heinonen, Brynhildur Davíðsdóttir
Of booms, busts, and sustainability: A socio-technical transition study of Iceland's mobility regime and its proximity to strong sustainability

Frederik De Roeck, Katrien Van Poeck
Agency in action: Towards a transactional approach for analyzing agency in sustainability transitions, Environmental Innovation and Societal Transitions

Carmen Valor, Juan Martino, Leonor Ruiz
Blends of emotions and innovation (Non)adoption: A focus on green energy innovations

Luc F.M. van Summeren, Anna J. Wieczorek, Geert P.J. Verbong, Gunter J.T. Bombaerts
Blending in, to transform the regime from within: Niche hybridisation strategies of Irish energy communities

Peter Gollagher, Sebastian Fastenrath
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Filka Sekulova, Isabelle Anguelovski, Lucía Argüelles
Redefining success in organizing towards degrowth

Laur Kanger, Peeter Tinits, Anna-Kati Pahker, Kati Orru, Aro Velmet, Silver Sillak, Artjoms Šeļa, Olaf Mertelsmann, Erki Tammiksaar, Kristiina Vaik, Caetano C.R. Penna, Amaresh Kumar Tiwari, Kalmer Lauk
Long-term country-level evidence of major but uneven ruptures in the landscape of industrial modernity

Isabell Braunger
Communal heat planning: Overcoming the path-dependency of natural gas in residential heating?

Clara Caiafa, Takashi Hattori, Hoseok Nam, Heleen de Coninck
International technology innovation to accelerate energy transitions: The case of the international energy agency technology collaboration programmes

Special Issue on Advancing the understanding of social innovation in sustainability transitions: Potentials, processes, and policies for accelerating

Marta Strumińska-Kutra, Agata Dembek, Sabine Hielscher, Maria Stadler
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James Carroll, Eleanor Denny, Adam Ferris, Ivan

Petrov, Hangjian Wu
A socio-economic examination of participation in socially innovative energy projects

Attila Havas, Doris Schartinger, K. Matthias Weber
Innovation studies, social innovation, and sustainability transitions research: From mutual ignorance towards an integrative perspective?

Flor Avelino, Sabine Hielscher, Marta Strumińska-Kutra, Tessa de Geus, Linda Widdel, Julia Wittmayer, Alicja Dańkowska, Agata Dembek, Maria Fraaije, Jasmin Heidary, Marfuga Iskandarova, Karoline Rogge, Agata Stasik, Franco Crudi
Power to, over and with: Exploring power dynamics in social innovations in energy transitions across Europe

Perspectives

Thomas Bauwens, Denise Reike, Martín Calisto-Friant
Science for sale? Why academic marketization is a problem and what sustainability research can do about it

Review Article

Natascha van Bommel, Johanna I. Höffken
The urgency of climate action and the aim for justice in energy transitions – dynamics and complexity

Paul Moritz Wiegmann, Madis Talmar, Sjoerd Bastiaan de Nijs
Forging a sharper blade: A design science research approach for transition studies

Andersen, A.D., and Geels, F.W. (2023)
Multi-system dynamics and the speed of net-zero transitions: Identifying causal processes related to technologies, actors, and institutions
Energy Research & Social Science, 102, 103178
Link

Reaching net-zero GHG emission targets will require transitions in all socio-technical systems, including electricity, mobility, heating, and agri-food. While most research focuses on transitions in single systems, it is essential to also investigate multi-system interactions since innovations like electric vehicles, heat pumps, or circular economy initiatives will require interactions between multiple systems. Although extant research acknowledges this topic to some extent, it offers limited understandings of the causal processes underpinning multi-system interaction. Building on multi-system research in the sustainability transitions literature, the paper therefore aims to develop a first inventory of causal processes of multi-system interactions in net-zero transitions, focused on technological, actor, and institutional dimensions. To elaborate and substantiate this contribution, the paper applies a narrative review methodology to identify six causal processes based on integration of insights from relevant social science theories with a multi-system dynamics approach based on the Multi-level Perspective. We illustrate causal processes with examples from the net-zero transition and articulate their implications for the speed of change.

Boe-Lillegraven, S., Georgallis, P., Kolk, A. (2023)
Sea change? Sensemaking, firm reactions, and community resilience following climate disasters
Journal of Management Studies
Link

Communities around the world face increasing risks of climate disasters such as floods, hurricanes, and droughts. What drives firms' heterogeneous responses to a climate disaster, and what could be the consequences for community resilience? To address these questions, we theorize how different aspects of sensemaking (sense of place, time, certitude, and loss) affect firm responses. Then, aided by an elaborate thought experiment – a narrative scenario of a future flood hitting the Dutch coast – we theorize how heterogeneity in firms' initial responses can trigger sensemaking-sensegiving cycles that spiral a community towards reconstruction or unplanned retreat. Our article advances understanding of firms' heterogenous disaster responses, the drivers of community resilience, and uncovers potential tensions between organizational and community resilience. We also contribute to sensemaking theory by relaxing the popular assumption that sensegiving requires deliberation. Finally, our article

showcases how narrative scenarios of future events can expand the methodological toolkit of organization theory and points to new opportunities for future interdisciplinary work.

Baatz, A., Ehnert, F. (2023)
Reframing places, communities and identities: social learning in urban experimentation
Sustainability: Science, Practice and Policy, 19:1
Link

A central promise of urban experiments (UEs) is to create sites for social learning. However, research on such learning in sustainability transitions still lacks conceptual clarity and empirical evidence. This article helps to close this gap by analyzing how social learning emerges from urban experimentation. It adopts a transactional understanding of learning induced by disruptions of everyday habits and distinguishes cognitive, normative, and relational learning processes. Further, the additional dimension of socio-material learning is derived to account for changes in understanding or interpreting material realities. These concepts serve an analytical framework for a case study of two transition experiments carried out as part of the transdisciplinary research project "Dresden – City of the Future." The two UEs strive to initiate local sustainability transitions pertaining to participatory governance of urban districts and co-creation of a livable schoolyard. The empirical results illustrate how interventions by the two UEs induced learning in the sense of changes of cognitive understandings, norms, relations among people, as well as between people and their socio-material environments. The experiments encouraged individual and collective learning and in particular the formation of collective identities and interpretations of specific places. By comparing two UEs, we further show differences in learning regarding the actor groups, namely that the majority of learning processes in the first experiment dealt with bridging the gap between prevalent routines of the school community and novel habits introduced by the initiators of the experiment. Participants of the second experiment were socio-ecologically minded from the outset and therefore fewer learning processes took place in this regard.

Braams, R. B., Wesseling, J. h., Meijer, A.J., Hekkert M. P. (2023)
Civil servant tactics for realizing transition tasks understanding the microdynamics of transformative government
Public Administration
Link

The transition literature argues that governments have an essential role in facilitating societal transitions. The current paper aims to provide a theoretical and empirical understanding of this government role by analyzing the work of entrepreneurial civil servants. These civil servants try to execute transition tasks but are often resisted by their colleagues who invoke dominant traditions in Public Administration. This raises the question of how they deal with this resistance and manage to execute government transition tasks. We introduce a heuristic rounds-model to understand the interplay between contestation and responses. Due to its subsequent rounds, the model shows ongoing tactical work navigating opposition and uncovers the tactics' temporariness and their capacity to backfire. We illustrate the value of the heuristic model by analyzing the clash between opposing rationalities and the change agents' continuous tactical adjustment in our case study on "Mobility as a Service" in the Netherlands.

Ehnert, F. (2023)
Bridging the old and the new in sustainability transitions: The role of transition intermediaries in facilitating urban experimentation.
Journal of Cleaner Production 417, 138084
Link

As experimentation with niche innovations confronts the old with the new, intermediaries are important to bridge innovative niches and established regimes. While there is a broad literature on experimentation to foster urban sustainability transitions, there is limited understanding of intermediaries acting as facilitators and translators. Previous studies of transition intermediaries in urban experimentation adopt a scaling-centric focus, which rests on the assumption that novelty emerges within niches and impacts regimes through processes of scaling-up. By contrast, this study shifts towards a reconfiguration perspective to move beyond the niche-regime dichotomy and provide a more fine-grained conception of how novelty emerges in-between niches and regimes, as well as through within-regime dynamics. This is to build a dialogue between the literature on urban experimentation and the literature on intermediaries in sustainability transitions. It is to shed light on the ambigious and heterogeneous nature of regime actors: they do not only reproduce path dependencies, but can also facilitate path creation. It implies a shift from a meso- towards a micro-level of analysis, which reveals the variety of intermediaries and their interactions. The study provides an empirical exploration of niche and regime intermediaries in local experimentation by analysing the transdisciplinary research project "Dresden – City of the Future: Empowering Citizens, Transforming Cities!". The qualitative case study follows an explorative approach, which provides empirical insights on intermediaries' activities that could not be anticipated during the initial research design. The interaction between niche and regime intermediaries shows the importance of recognising the dialectic nature of change from below and change from above. While niche

intermediaries acted more as visionaries, knowledge brokers and advocates of change, regime intermediaries acted more as guides and facilitators, creating a shared institutional infrastructure and coordinating local-level activities. It reveals the (dis)empowering dynamics that underlie niche-regime interaction but also power struggles regime intermediaries are confronted with. These findings provide insights for governance strategies to strengthen the position of transition intermediaries. They suggest that the work of intermediaries should no longer be hidden and informal but recognised as an essential part of transition governance. A variety of both niche and regime intermediaries should be fostered to build interfaces between niches and regimes, and bring about reconfiguration.

Fastenrath, S., Tavassoli, S., Sharp, D., Raven, R., Coenen, L., Wilson, B., Schraven, D. (2023)
Mission-oriented Innovation Districts: towards challenge-led, place-based urban innovation
Journal of Cleaner Production. 418, 138079
Link

In recent years, there has been rapidly growing interest in Innovation Districts (ID) in urban policy and practice. IDs are touted as catalysts for innovation and economic development involving a wide range of stakeholders often in under-performing neighbourhoods or precincts. Despite the appeal, critique is forming around their linear understanding of innovation, the narrow focus of economic goals and lack of directionality in addressing grand societal challenges. This paper proposes the concept of Mission-Oriented Innovation Districts (MOID). MOID are thought to help design, shape and drive transformative change from a place-based perspective. Methodologically, this paper conceptually reviews antecedents of and draws on a structured search and scoping review of the two popular but disjointed literatures on ID and Mission-Oriented Innovation (MOI). Drawing on an analysis of 99 journal articles, this paper seeks to provide a better understanding about differences and common grounds of the two strands of literature. Five analytical categories are developed and applied to assess and interpret insights from existing publications: (1) understandings, definitions, and objectives; (2) theoretical- conceptual underpinnings; (3) analytical and methodological approaches; (4) evaluation; and (5) governance. We find that there is ample opportunity for cross-fertilization of insights across these two literatures. Based on this in-depth analysis, the contours of a new concept of MOID are outlined through a formal definition of MOID and insights from the analysis are translated into future research questions to inform a transformative agenda for innovation policy.

Iyabano, A., Leeuwis, C., Lie, R., Toillier, A., Waters-Bayer, A. (2023)
Making decisions about agroecological innovations: perspectives from members of farmers' organizations in Burkina Faso
International Journal of Agricultural Sustainability, 21:1
Link

There is a growing promotion of agroecological techniques in many Sub-Saharan African countries as a response to the current climatic variability challenges. In the case of Burkina Faso, a number of studies have mentioned the role of Farmers' Organizations (FOs) in the promotion of agroecological techniques. Although previous studies have highlighted the role of FOs in agroecology, more detailed studies on the effectiveness of their intermediation activities and especially those focusing on the way the FOs influence farmers' agroecological innovations decisions are still scarce. This study addresses this gap by providing the answer to the question of what drives farmers' decisions to implement agroecological innovations and how their FOs influence these decisions. The results show that the implementation of agroecological innovations varies, with some farmers using many and others few of the innovations promoted by their respective FOs. Farmers' implementation of these innovations is largely influenced by the actions of their FOs on at least one of the three drivers of individual motivation or innovation behavior (Vroom 1964): instrumentality, valence, and expectancy. Finally, the study calls for policy actors to increase funding support to FOs for widening their continuous provision of agroecology development activities.

Jewell, J. & Cherp, A.(2023)
The feasibility of climate action: Bridging the inside and the outside view through feasibility spaces
Wiley Interdiscip Rev Clim Change
Link

The feasibility of different options to reduce the risks of climate change has engaged scholars for decades. Yet there is no agreement on how to define and assess feasibility. We define feasible as "do-able under realistic assumptions." A sound feasibility assessment is based on causal reasoning; enables comparison of feasibility across climate options, contexts, and implementation levels; and reflexively considers the agency of its audience. Global climate scenarios are a good starting point for assessing the feasibility of climate options since they represent causal pathways, quantify implementation levels, and consider policy choices. Yet, scenario developers face difficulties to represent all relevant causalities, assess the realism of assumptions, assign likelihood to potential outcomes, and evaluate the agency of their users, which calls for external feasibility assessments. Existing approaches to feasibility assessment mirror the "inside" and the "outside" view

coined by Kahneman and co-authors. The inside view considers climate change as a unique challenge and seeks to identify barriers that should be overcome by political choice, commitment, and skill. The outside view assesses feasibility through examining historical analogies (reference cases) to the given climate option. Recent studies seek to bridge the inside and the outside views through "feasibility spaces," by identifying reference cases for a climate option, measuring their outcomes and relevant characteristics, and mapping them together with the expected outcomes and characteristics of the climate option. Feasibility spaces are a promising method to prioritize climate options, realistically assess the achievability of climate goals, and construct scenarios with empirically-grounded assumptions.

Jolly, S., Steen, M., Hansen, T., & Afewerki, S. (2023)
Renewable energy and industrial development in pioneering and lagging regions: the offshore wind industry in southern Denmark and Normandy
Oxford University Press (OUP)
Link

The increasing deployment of renewable energy (RE) hinges on the development and upscaling of manufacturing and logistics capacities, offering industrial development opportunities for regions and countries. In this paper, we analyse how contextual factors pertaining to pre-existing regional assets and multi-scalar institutional environments influence RE-related industrial development at the regional scale. To this avail, we purposefully selected two contrasting regional case studies of offshore wind energy-related industry developments in Southern Denmark (a pioneering region) and Normandy (France, a latecomer region) and discuss developments until 2020. Our qualitative analysis is informed by theoretical and empirical insights from the economic geography and sustainability transitions research fields. The identified contrasting regional path creation processes reflect substantial differences in context conditions, providing insights into how regions can capture value in the ongoing energy transitions.

Kok, K. P.W., Klerkx, L., (2023)
Addressing the politics of mission-oriented agricultural innovation systems
Agricultural Systems, Volume 211,
Link

Mission-oriented agricultural innovation systems (MAIS) are becoming more prevalent in view of tackling the challenges of agri-food systems transformation. In this perspective, we argue that the politics of MAIS requires more comprehensive and considerable attention in the field, given the contested and deeply normative nature of the direction of innovations in agri-food systems transformation. Literature from development studies, policy sciences, and transition studies is reviewed to inform the perspective. We question the politics of MAIS structured around the dimensions of the 4D framework: directionality, diversity, distribution and democracy. Regarding directionality, MAIS should explicitly consider how power dynamics shape the direction of innovation and future agri-food systems, and to which extent these power dynamics hinder desirable directions. Considering diversity means that MAIS need to stimulate a diversity of transformation pathways; include a diversity of actors, communities and knowledge; and consider roles of both humans and non-humans in transformation. Questions regarding the distribution of resources and effects of innovations across ecosystems and communities imply that MAIS should actively advance just transitions across different scales and geographical contexts. Finally, democratization of MAIS in our view means that the ways in which knowledge and innovations are produced through MAIS should be more democratic and deliberative, though this may be challenging since missions imply strong steering. We stress that these 4D considerations also bring along important implications for the ways policies and research on and in MAIS, and agri-food system transformation more broadly, are considered. Confronting the politics of MAIS is not an easy endeavor, but critical to advance agri-food system transformation in directions that are not only sustainable and transformative, but also socially just and desirable. This requires for agricultural systems researchers to develop awareness on how their work feeds into the politics of MAIS, and conversely is influenced by it.

Krantz, D. (2023).
Fighting the Fossil-Fuel Pharaoh: American Jews and Climate Action.
Routledge Handbook of Religion and Politics, 3rd edition
Link

In the face of the climate crisis, the number of religious communities around the world advocating for climate action is small but growing. Yet, whither Jews on climate change? Covering decades of Jewish political activism on global warming and climate change, this heretofore undocumented history of the Jewish climate movement spans from its energy-focused birth to today's multi-stakeholder-populated subfield of the Jewish environmental movement. How has Judaism guided their actions? What do Jewish groups see as their religious obligations in response to climate change? The growth of the nascent Jewish climate movement points to climate change as an increasingly important political concern for American Jews.

Lähteenoja, S., Marttila, T., Gaziulusoy, İ., &

Hyysalo, S. (2023)
Transition co-design dynamics in high level policy processes
Design Studies, 88, 101207
Link

Despite the increasing interest in bringing together the fields of sustainability transitions and design research, the ways transition design connects to earlier theories on design action have not been extensively studied. By using Buchanan's (1992; 1998) 'four orders of design' and Young's (2008) 'complexity in design' models as a framework, this article provides an empirical example of how to examine transition co-design dynamics. With a case study of a national sustainable development strategy creation in Finland, we argue that design does not only contribute to transition processes instrumentally but also from attitudinal and intellectual perspectives. Designing for transitions blends existing forms of design work for success, and it offers new agencies for design in supporting governance of highly complex policy processes.

Lægreid, O. M., Cherp, A. & Jewell, J. (2023)
Coal phase-out pledges follow peak coal: evidence from 60 years of growth and decline in coal power capacity worldwide
Oxf. Open Energy 2,
Link

Transitioning to net-zero carbon emissions requires phasing-out unabated coal power; however, recently it has only been declining in some countries, while it stagnated or even increased in others. Where and under what circumstances, has coal capacity reached its peak and begun to decline? We address this question with an empirical analysis of coal capacity in 56 countries, accounting for 99% of coal generation in the world. The peaks in national coal power have been equally spread per decade since 1970. The peaks are more likely to occur in country-years with high levels of electoral democracy, higher GDP per capita, slower electricity demand growth, and with low levels of political corruption. Normally, peaking coal power preceded rather than followed political coal phase-out pledges, often with long time lags. We conclude that though the cost of coal alternatives are declining and concerns over climate change increasing, coal power does not automatically peak even in situations with low demand growth, aging power plants and high import dependence. A quick and decisive destabilization of coal regimes requires, in addition, having sufficient economic capacities and strong democratic governance.

Loder, J., Rinscheid, A., Wüstenhagen, R. (2023)
Why do (some) German car manufacturers go electric? The role of dynamic capabilities and cognitive frames
Business Strategy and the Environment, 1–15.
Link

After the internal combustion engine was the dominant technology in the automotive industry for more than a century, a transition to electric cars is now under way. However, not all car manufacturers seem equally determined to move away from fossil fuels. Based on a comparative case study of German automakers, we discuss some underlying factors associated with variation in electrification strategies. Conceptually, we focus on firms' dynamic capabilities—in particular, their ability to sense low-carbon risks and opportunities in a changing business environment. Building on qualitative interviews, we gauge sensing capabilities through industry executives' cognitive frames. Our analysis reveals striking differences in the way executives perceive the opportunities and risks associated with electric mobility. In particular, firms' dynamic capabilities to shape the low-carbon transition are tied to their conceptions of consumer preferences and the economics of the transition, their perception of network embeddedness, prior experiences with technological innovation, and leadership.

Löhr, M., Chlebna, C. (2023)
Multi-system interactions in hydrogen-based sector coupling projects: System entanglers as key actors Energy Research & Social Science 105, pp. 1-15
Link

In advanced transition processes sector coupling becomes key to reach net zero objectives. The literature on multi-system interactions addresses the coupling of different systems by analysing how technologies, institutions, and actors connect. Our contribution zooms in on better understanding the concrete activities and characteristics of actors who work to integrate different systems. It is crucial to understand how actors realise the integration of sectors as the coupling represents a major bottleneck in accelerating transition processes. To identify their activities, we build on the recently established concept of transition work, which adapts the institutional work framework for use in the analysis of transition processes and link it to the concept of 'system entanglers'. System entanglers are actors who connect different systems. Empirically, we apply our conceptual framework to three qualitative case studies of hydrogen-based sector coupling projects within mobility, heating, and industry in Germany. We find that for system entanglers cross-sectoral competencies and learning, as well as fostering between-system links, are key to connect different systems. We identify further key characteristics of system entanglers and discuss how the sectoral context, the constellation of actors in projects, and the self-perception of the respective actors matter.

Matti, C., Jensen, K., Bontoux, L., Goran, P., Pistocchi, A. and Salvi, M. (2023)
Towards a fair and sustainable Europe 2050: Social and economic choices in sustainability transitions
Publications Office of the European Union
Link

This foresight study explores possible and necessary changes in the European social and economic systems as the European Union engages in managing sustainability transitions towards 2050. With this focus, the study presents strategic areas of intervention covering a new social contract, governance for sustainability, people and economy, and the global perspective on sustainability. The study reflects on the agency of EU actors (such as government at various levels, business, and communities) to address the strategic areas of intervention as part of collectively addressing sustainability transitions. The study builds on a participatory foresight exercise, which generated four foresight scenarios for a climate-neutral EU in 2050. Based on each scenario, a corresponding transition pathway was co-created and analysed through the process. The study presents and analyses these outputs of the process. The outputs can also serve as input to policymakers and practitioners interested in conducting new participatory exercises on sustainability transitions.

Nguyen, T.M.P, Davidson, K. (2023)
Institutionalising 100 Resilient Cities governance experiments in cities with no metropolitan government: A case study of Living Melbourne (Resilient Melbourne), Australia
Cities, Volume 141, 104500
Link

This paper investigates the institutionalisation of 100 Resilient Cities [100RC] governance experiments in cities that lack a metropolitan government. In examining this phenomenon, the research develops a novel analytical framework that builds upon the 'beyond experiments' literature and two conceptual foundations: the role of urban governance context, particularly cities lacking a metropolitan government, and the role of transnational city networks. The framework is then applied to review the case study of Living Melbourne (Resilient Melbourne) – a 100RC governance experiment implemented in Melbourne, Australia. Key findings show that the institutionalisation of 100RC governance experiments occurs in cities lacking a metropolitan government by generating new changes in governance, particularly around two key domains: ways of thinking and ways of organising. The study also reveals that most changes generated via institutionalisation are incremental and reformistic, rarely transformational adjustments that can directly bring about urban sustainability transitions. In addition, this research suggests that the extent of institutionalisation is influenced by three key factors: (1) existing metropolitan governance conditions, (2) internal conditions of governance experiments and (3) city networks (only to a limited extent).

Raven, R.P.J.M., Hadfield, P., Butler, B., Giraud, G., Eagleton, J., Markard, J., Schiller, K., Swilling, M., Tshangela, M. (2023)
Transitioning to sustainable academic conferences needs more experimentation and reflection
Global Sustainability, 1-5
Link

In response to increasing demands to move away from carbon-intensive academic conferences, and a need to address social justice issues, the author-team designed, implemented, and experimented with a new conference model. Three key-design choices informed the model. First, instead of the common single-host-single-location approach, we established a partnership between three universities across three continents. Second, we adopted a hub model of three online conference days, followed by three non-hybrid, in-person only conference events. Third, we sought to accommodate global participation by organising each of the online conference days during daylight hours in the respective time zones. We find that the model promotes less air travel and improved global south participation. Our approach adds to a growing number of experiments with new modes of academic conferencing in a world that is facing climate and inequality crises.

Rettig, E., Fischhendler, I., & Schlecht, F. (2023)
The meaning of energy islands: Towards a theoretical framework
Renewable and Sustainable Energy Reviews, Volume 187
Link

The term 'energy island' encompasses contradicting interpretations to electricity connectivity and isolation. Scholars and practitioners use the same term to describe contrasting scenarios that address different problems and widely divergent policy goals. These may include physically secluded islands trying to connect to the mainland to increase their energy security, or countries wishing to actively isolate their electricity systems from a hostile surrounding region, or artificial islands that enable more integration of renewable energy systems, or microgrids that enable communities and regions to voluntarily disconnect from their country's national grid for political purposes. The understanding of energy islands as either an opportunity to pursue or a

vulnerability to overcome can thus differ based on factors such as economic constraints, technical capabilities, security of supply, or political aspirations for sovereignty and independence. This study provides a comprehensive framework for unpacking the term 'energy island' and analyzing the various factors that influence its development. It does so by conceptualizing energy islands as a spatial interaction between three boundaries: a physical boundary, a political boundary, and an electricity service boundary. By examining the interplay between these boundaries, this study identifies six different types of energy islands that represent six distinct configurations of electricity isolation, as well as seven policy trajectories that allow them to transition from one type to another. This novel theoretical framework facilitates a better understanding of why and when policymakers choose to either abandon or strengthen their country's electricity isolation and identifies the physical and institutional solutions they employ to achieve their goals.

Shittu, O., Nygaard, C. (2023).
Transitioning to circular plastic economies in cities: conceptual and policy implications of a practice perspective
Sustainable Urban Transitions. Springer
Link

The transition to a circular plastic economy (CPE) in cities requires changing how plastic is used and circulated through economic systems. However, current frameworks for understanding CPEs tend to be economic-centric and overly focused on physical features, which may reinforce linear models of production and consumption. This chapter proposes an alternative conceptual analysis of the CPE through the practice perspective, which adopts the 'zooming out and in' methodology to conceptualise the CPE as a teleoaffective formation. This means the CPE is seen as a constellation of practice complexes oriented towards sustainable plastic production and consumption. The chapter explores practice formations related to plastic use at various levels and their implications for sustainability transitions. It analyses how plastic contributes to the performance of household practices and how they, in turn, enhance the spatial-temporal mobility of plastic circularity. It also examines the influence of practice complexes outside the household domain on household plastic use. The chapter concludes by suggesting a need to transition the existing compound or disintegrated set of sustainability practices into an integrative or well-defined and formalised web of sustainability practices that enable the circularity of plastic materials. This transition from the current linear model of plastic use to the CPE has implications for research and policy. It requires a shift in focus from waste infrastructure, recycling technology, and behavioural change to a more comprehensive understanding of the teleoaffective formation of the CPE.

Shittu, O. (2023)
Grassroots strategies for environmental governance and circular transitions in cities: lessons from Lagos and Melbourne
A Research Agenda for Sustainable Cities and Communities. Cheltenham, UK: Edward Elgar Publishing
Link

Chapter 8 explores grassroots mobilisation in sustainability governance towards circular cities, drawing on lessons from Lagos and Melbourne. Shittu suggests that advancing circular transitions involves galvanising and synergising sustainability initiatives across all social domains, including households and communities. Given the extensive and perhaps radical changes that implementing circular policies will bring to household and community socio-material practices, it is imperative that cities enable the emergence of circular practices and actively promote people's involvement in environmental governance. The chapter outlines that communities of practice can enable circular transitions in cities by scaling up, sustaining, and guiding the transformation of circular practices through household recruitment, shared learning, and innovation trials. In addition, resolving environmental constraints to perform sustainability practices, promoting sustainability values, and integrating upstream and downstream circular solutions are strategies that could accelerate circular transitions in cities.

Stirling, A., Cairns, R., Johnstone, P., Onyango, J., (2023)
Transforming imaginations? Multiple dimensionalities and temporalities as vital complexities in transformations to sustainability
Global Environmental Change, Volume 82, pp: 1-13
Link

Through interlinked theoretical and empirical analysis, this paper explores some important but neglected questions concerning efforts to achieve sustainability. To what extents do currently dominant forms of academic study and policy visions in this field, satisfactorily address the full political depth and scope of *vital complexities* in pathways for emerging social transformations? Are there dangers that common simplifications in mainstream ways of thinking about transformation, inadvertently help invisibly to reproduce entrenched patterns of privilege and power that drive focal problems of unsustainability? In particular, does a '*monothetic*' focus on circumscribed sites or sectoral formations with notionally few clear-cut dimensions of distinction before and after, risk missing more multiple

and messy '*polythetic*' dimensionalities in which power and privilege can hide? What are the implications of common assumptions that pathways for change proceed '*monotonically*' – neatly and cumulatively in a particular direction, if real world transformations actually unfold according to more plural, undulating and unruly '*non-monotonic*' temporalities? In order to investigate these questions, the paper employs the concept of sociotechnical imaginaries to explore the constituting dimensions of contrasting understandings of 'urban transformations' in Kenya and 'the nuclear renaissance' in the UK. Q method and in-depth interpretive policy analysis are used to test patterns in relationships between imagined transformations and their unfoldings over time. The findings suggest that current mainstream approaches may indeed unduly simplify vital complexities in the ways these political dynamics play out – with potentially important practical implications.

Tilsted, J. P., Palm, E., Bjørn, A., Lund, J. F. (2023)
Corporate climate futures in the making: Why we need research on the politics of Science-Based Targets
Energy Research & Social Science. 1;103:103229
Link

In this Perspective article, we call for more scholarly attention to the politics of the Science-Based Targets initiative (SBTi). Specifically, we argue for a need to examine the emission pathways and decarbonised futures that are expressed and promoted through Science-Based Targets and what futures they render more likely in the pursuit of low-carbon transitions. We highlight how the SBTi's guidance material is characterized by a narrow and linear view of science (as input) as well as a similarly narrow portrayal of decarbonised futures (as outcome), despite the negotiated character of target-setting and the open-endedness of transitions. The SBTi thus currently tends towards obscuring the politics embedded within it and promoting an incumbent-driven transition, thereby legitimizing a transition shaped by some of the world's largest corporations and, in this sense, shielding them from democratic control. This argument illustrates the need for more scholarly engagement with the politics of knowledge that informs the SBTi and its governance framework. On a broader note, it highlights the need for continued critical engagement with corporate climate governance as it develops and takes on more ambitious forms.

Trencher, G., Rinscheid, A., Rosenbloom, D., Koppenborg, F., Truong, N., Temocin P. (2023)
The evolution of "phase-out" as a bridging concept for sustainability: From pollution to climate change
One Earth, Volume 6, Issue 7
Link

Many sustainability challenges, such as contamination of air, water, and soil or climate change, can be traced back to specific polluting substances (e.g., mercury), technologies (e.g., combustion engines), or practices (e.g., waste dumping). To confront these grave challenges, "phase-out" is garnering increasing attention as a policy approach. Although the literature on phase-out is burgeoning, it remains unclear how the concept has evolved across scientific disciplines and policy. In this review, we use a coding-based mapping approach to systematically unpack the scientific discourse on phase-out since 1970, focusing on the contribution of different scientific disciplines, targets and drivers of phase-outs, instruments, affected industries, and geographical context. We find that the focus of phase-out has shifted from toxic pollution to climate change, and that the scope of phase-out targets has broadened. Results further suggest that phase-out is emerging as a bridging concept to foster transdisciplinary dialogues and transformative actions toward greater sustainability.

Vallone, S., Lambin, E. F., (2023)
Public policies and vested interests preserve the animal farming status quo at the expense of animal product analogs
One Earth 6, 1–14
Link

A transformation of the food system that heavily relies on animal-derived foods is required to reduce its impact on climate, deforestation, and biodiversity. This challenge demands an understanding of the policies and vested interests enabling or hindering progress toward sustainable production systems. We applied the multilevel perspective framework to evaluate the incumbent sociotechnical regime—animal farming—and the niche innovations producing animal product analogs. We conducted a comparative analysis of the United States and European Union to assess possible trajectories of food system transition. Our findings reveal that, although in recent years both governments have invested in niche innovations and have started to modify regulations, they mostly preserved the status quo of animal-based production and consumption. Despite the urgency to increase food system sustainability, policies failed to address the environmental impacts of animal-based technologies. Powerful vested interests exerted their political influence to maintain the system unchanged and to obstruct competition created by technological innovations.

Vinichenko, V., Jewell, J., Jacobsson, J., Cherp, A. (2023)
Historical diffusion of nuclear, wind and solar power in different national contexts:

implications for climate mitigation pathways.
Environmental Research Letters 18
Link

Climate change mitigation requires rapid expansion of low-carbon electricity but there is a disagreement on whether available technologies such as renewables and nuclear power can be scaled up sufficiently fast. Here we analyze the diffusion of nuclear (from the 1960s), as well as wind and solar (from the 1980–90s) power. We show that all these technologies have been adopted in most large economies except major energy exporters, but solar and wind have diffused across countries faster and wider than nuclear. After the initial adoption, the maximum annual growth for nuclear power has been 2.6% of national electricity supply (IQR 1.3%–6%), for wind – 1.1% (0.6%–1.7%), and for solar – 0.8% (0.5%–1.3%). The fastest growth of nuclear power occurred in Western Europe in the 1980s, a response by industrialized democracies to the energy supply crises of the 1970s. The European Union (EU), currently experiencing a similar energy supply shock, is planning to expand wind and solar at similarly fast rates. This illustrates that national contexts can impact the speed of technology diffusion at least as much as technology characteristics like cost, granularity, and complexity. In the Intergovernmental Panel on Climate Change mitigation pathways, renewables grow much faster than nuclear due to their lower projected costs, though empirical evidence does not show that the cost is the sole factor determining the speed of diffusion. We demonstrate that expanding low-carbon electricity in Asia in line with the 1.5 °C target requires growth of nuclear power even if renewables increase as fast as in the most ambitious EU's plans. 2 °C-consistent pathways in Asia are compatible with replicating China's nuclear power plans in the whole region, while simultaneously expanding renewables as fast as in the near-term projections for the EU. Our analysis demonstrates the usefulness of empirically-benchmarked feasibility spaces for future technology projections.

Vinichenko, V., Vetier, M., Jewell, J., Nacke, L. & Cherp, A.. (2023)
Phasing out coal for 2 °C target requires worldwide replication of most ambitious national plans despite security and fairness concerns
Environ Res Lett 18, 014031
Link

Ending the use of unabated coal power is a key climate change mitigation measure. However, we do not know how fast it is feasible to phase-out coal on the global scale. Historical experience of individual countries indicates feasible coal phase-out rates, but can these be upscaled to the global level and accelerated by deliberate action? To answer this question, we analyse 72 national coal power phase-out pledges and show that these pledges have diffused to more challenging socio-economic contexts and now cover 17% of the global coal power fleet, but their impact on emissions (up to 4.8 Gt CO2 avoided by 2050) remains small compared to what is needed for achieving Paris climate targets. We also show that the ambition of pledges is similar across countries and broadly in line with historical precedents of coal power decline. While some pledges strengthen over time, up to 10% have been weakened by the energy crisis caused by the Russo-Ukrainian war. We construct scenarios of coal power decline based on empirically-grounded assumptions about future diffusion and ambition of coal phase-out policies. We show that under these assumptions unabated coal power generation in 2022–2050 would be between the median generation in 2 °C-consistent IPCC AR6 pathways and the third quartile in 2.5 °C-consistent pathways. More ambitious coal phase-out scenarios require much stronger effort in Asia than in OECD countries, which raises fairness and equity concerns. The majority of the 1.5 °C- and 2 °C-consistent IPCC pathways envision even more unequal distribution of effort and faster coal power decline in India and China than has ever been historically observed in individual countries or pledged by climate leaders.

Wesseling, J. H., Meijerhof, N. (2023)
Towards a Mission-oriented Innovation Systems (MIS) approach, application for Dutch sustainable maritime shipping
PLOS Sustainability and Transformation 2 (8)
Link

This paper builds on the literature on mission-oriented innovation policy, governance, transition studies and innovation systems, and develops a structural-functional approach to formatively evaluate mission governance from a Mission-oriented Innovation Systems (MIS) perspective. Central to this MIS approach is the mission arena, a governance structure where actors formulate and govern the mission, by mobilizing and directing other, preexisting system components. Their goal is to meet the mission by developing and diffusing innovative mission solutions and destabilizing harmful practices. The MIS approach involves a problem-solutions diagnosis and an analysis of structural, functional, and systemic barriers. To provide formative mission governance recommendations, the systemic barriers are then contrasted with the mission arena's governance tasks. To illustrate the value of the MIS approach, we use a case study of the Dutch mission for sustainable maritime shipping. This case study illustrates a mission arena striving to increase coherence amongst different innovation system structures in semblance of a MIS. The mission arena configuration of actors shaped the mission formulation and negotiated governance actions. Dominant industry networks negotiated green growth as

problem direction and non-committal governance actions, which are likely ineffective for inherently transformative sustainability missions. The paper concludes by identifying directions for further developing the MIS approach and the mission arena concept.

Williams, T. G., Bui, S., Conti, C., Debonne, N., Levers, C., Swart, R., & Verburg, P. H.(2023)
Synthesising the diversity of European agri-food networks: A meta-study of actors and power-laden interactions
Global Environmental Change: Human and Policy Dimensions, 83(102746), 102746.
Link

Farmers are at the centre of scientific and political debates about sustainability in European agriculture, but rarely do we discuss the roles of other actors who shape their behaviour. Understanding the interactions and balance of power in agri-food systems is critical to effectively govern sustainability transitions. Here, we conduct a meta-study of 71 case studies in European agri-food systems to synthesise evidence on the diversity of actors and network configurations. We characterise the reported power-laden relationships to generate an agri-food network for each case study and then create a typology of archetypical network configurations. Our study provides three major insights. First, we find a diverse range of actors and complex network configurations. This indicates that the predominant focus on farmers in sustainability policy overlooks the other actors in their agrifood networks, thus risking suboptimal policy design and efficacy. Second, the typology identifies three groups of networks – agro-industrial control, multifunctional value chains, and civic food networks – associated with diverging levels of farmer autonomy. Agricultural governance should therefore consider the context-specific agency of farmers; policies that target farmer decision-making can only have impact if farmers have the capacity to change. Third, the typology demonstrates the potentially complementary roles of conventional and alternative value chains, as well as top-down state support and bottom-up civil society mobilisation. Agri-food networks hence provide diverse leverage points for sustainability transformation.

Yang, K. (2023)
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This paper advances the concept of niche shielding in sustainability transitions studies by refining it as a dynamic process that evolves through niche-regime interactions. It contributes to the existing literature by contesting niche shielding dynamics from two aspects: (i) how niches shield against selection pressure from multiple dimensions of the socio-technical system (science and technology, industry, market, policy, culture); and (ii) how niche shielding unfolds across multiple scales (provincial, national and global). The empirical analysis focuses on wind power development in two Chinese provinces, Inner Mongolia and Jiangsu, which serve as contrasting cases with divergent niche shielding dynamics, as well as on a national scale. The findings highlight the importance of a pluralistic and spatially sensitive understanding of niche shielding dynamics. These insights shed light on when and how to phase out strategic interventions to facilitate the diffusion of radical innovations. The coordination of niche shielding across dimensions and scales is identified as a key factor in this process. Building on these insights, the paper proposes four scenarios of niche shielding dynamics, suggesting that the trajectory of niche development can involve complex patterns that shift among these four scenarios, rather than following a linear development of step-by-step phasing out of strategic interventions.